REMARKS

Claim 5 has been canceled without prejudice or disclaimer. Claims 1 and 6 have been amended. Claims 1-4 and 6 are now pending in the present application.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

I. The Rejection of Claims 1-6 under 35 U.S.C. 103(a)

Claims 1-6 are rejected under 35 U.S.C. 103(a) as allegedly unpatentable over WO 96/02632, with or without Saito et al. (US Pat. No. 4,250,305) or Glasser et al. (US Pat. No. 5,430,142). The Examiner contends that WO 96/02632 teaches treating pulp with Bacillus sp. SD902 to produce an xylose or xylooligosaccharide, and that the treated pulp can further be treated with a bleaching agent and/or alkali to bleach the pulp. The Examiner further contends that, if necessary, Glasser et al. teach treating xylose or xylooligosaccharide with methyl chloride to produce ethers. The Examiner also contends that Saito et al. teach treating cellulose with an etherifying agent to produce cellulose ethers.

As amended, claim 1 recites that the chemical modification involves "etherifying the treated pulp under conditions that result in etherification of cellulose molecules in the pulp." There is no teaching or suggestion in WO 96/02632 to etherify the cellulose molecules in the treated pulp. Thus, WO 96/02632 plainly does not render the claimed invention obvious.

The addition of either Glasser et al. or Saito et al. does not provide the suggestion missing from WO 96/02632. Indeed, Glasser et al. is directed to a process for modifying substantially pure xylans. Glasser et al. specifically discloses purifying a pentosan-rich faction away from a cellulosic fraction prior to modification to produce the xylan derivative. Thus, Glasser et al. clearly does not suggest the step of etherification of cellulose molecules, and indeed, teaches away from the present invention by suggesting that the cellulosic fraction should be discarded prior to chemical modification.

Saito et al. in combination with WO 96/02632 also does not suggest that the process of treating a pulp with a hemicellulase followed by etherifying the treated pulp under conditions that result in etherification of the treated pulp, and would result in cellulose derivatives exhibiting superior qualities, such as, improved filterability and decreased microgel formation. Indeed, as previously discussed, there is no suggestion

in WO 95/02632 that, following a hemicellulase treament, an artisan should employ an etherification step to provide an improved cellulose derivative. Conversely, there is no motivation in Saito et al. to first employ a hemicellulase step before etherification. Therefore, as there is no suggestion or motivation in either reference to employ a hemicellulase treatment, and then to employ and etherification modification, the obviousness rejections amounts to an improper hindsight analysis of the prior art.

Accordingly, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103(a). Applicants respectfully request reconsideration and withdrawal of the rejection.

II. The Rejection of Claims 1-6 under 35 U.S.C. 103(a)

Claims 1-6 have also been rejected under 35 U.S.C. 103(a) as allegedly unpatentable over WO 96/02632 in view of ADMITTED PRIOR ART (DE 4440245 C1). The Examiner states that the ADMITTED PRIOR ART teaches pretreating cellulose with an enzyme followed by modifying the enzyme treated cellulose with epoxy alkane in the presence of quaternary ammonium base to reduce the degree of cellulose depolymerization. The Examiner contends that it would be obvious to substitute the cellulase enzyme of WO 96/02632 for the cellulase enzyme of the ADMITTED PRIOR ART to reduce the degree of polymerization. This rejection is respectfully traversed.

As previously discussed, claim 1 recites a method for producing a cellulose derivative, said method comprising treating a pulp with a hemicellulase under conditions in which the hemicellulase is enzymatically active, and then etherifying the treated pulp under conditions that result in etherification of cellulose molecules in the pulp.

There is no teaching or suggestion in either WO 96/02632 or DE 4440245 C1 of an etherifying step, the combination of hemicellulase treatment followed by etherifying treatment, or that this combination of steps would result in cellulose derivatives exhibiting superior qualities, such as, improved filterability and decreased microgel formation.

Accordingly, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103(a). Applicants respectfully request reconsideration and withdrawal of the rejection.

III. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to

contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: December 12, 2001

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Attorney Docket No.: 5087.304-US PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Noguchi et al. Confirmation No: 9126

Serial No.: 09/371,343 Group Art Unit: 1731

Filed: August 10, 1999 Examiner: Alvo, M.

For: Method For Producing Cellulose Derivatives

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Sir:

Below is a marked-up version of the amendments made in the accompanying amendment.

IN THE CLAIMS:

Claims 1 and 6 have been amended as follows:

1. (Amended) A method for producing a cellulose derivative, said method comprising

c) treating a pulp with a hemicellulase under conditions in which the hemicellulase is enzymatically active, and

d) [chemically modifying] <u>etherifying</u> the treated pulp under conditions that result in [chemical modification] <u>etherification</u> of cellulose molecules in the pulp.

2. (Unchanged.) The method of claim 1, wherein the hemicellulase is an enzyme that hydrolyzes E-1,4-glycoside bonds.

3. (Unchanged.) The method of claim 1, wherein the hemicellulase is a xylanase.

4. (Unchanged.) The method of claim 1, wherein the xylanase is obtainable from *Bacillus sp.* SD902.

6. (Amended.) The method of any of claim<u>s</u> 1-<u>4</u>, wherein the chemical modification is methyl-etherification, ethyl-etherification, hydroxyethyl-etherification, hydroxypropyl-etherification, or carboxymethyl-etherification.